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1 The Accuracy of Initial Prediction in Two-Phase Dynamic Binary Translator
Youfeng Wu, Mauricio Breternitz, Justin Quek, Orna Etzion, Jesse Fang
March 2004   Proceedings of the international symposium on Code generation and runtime optimization

Full text available: 🔲 pdf(234.04 KB)   Additional Information: full citation

Dynamic binary translators use a two-phase approach to identify and optimize In the first step (profiling phase), blocks of code are interpreted or quickly tran information for the blocks. In the second phase (optimization phase), frequent regions and advanced optimizations are applied on them. This approach implici block is representative of the block t ...

2 Embedded systems: applications, solutions and techniques (EMBS): Asses coincident failures and usage-profiles on the reliability of embedded control
Frederick T. Sheldon, Kshamta Jerath
March 2004   Proceedings of the 2004 ACM symposium on Applied computing

Full text available: 🔲 pdf(327.91 KB)   Additional Information: full citation, abstract, re

The increasingly ubiquitous use of embedded systems to manage and control complex lives makes us more vulnerable than ever before. Knowing how relial necessary especially for safety, mission and infrastructure critical applications compositional modeling method for assessing reliability based on characteristi illustrate this using a classic embedded control sys ...

Keywords: design, measurement, performance, reliability

3 Static branch frequency and program profile analysis

Youfeng Wu, James R. Larus

November 1994   Proceedings of the 27th annual international symposium on M

Full text available: pdf(1.26 MB)   Additional Information: full citation, abstract, references, ci

Program profiles identify frequently executed portions of a program, which are
programmers and compilers the greatest benefit. Compilers, however, infrequ
profiling a program requires a programmer to instrument and run the program
compiler to statically estimate program profiles. This paper presents several n
prediction and profiling. The first ...

4 From profiles to patterns and back again: a branch and bound algorithm for

Eleazar Eskin

March 2004   Proceedings of the eighth annual international conference on Compu

Full text available: pdf(197.74 KB)   Additional Information: full citation, abstract, referen

An important part of deciphering gene regulatory mechanisms is discovering t
many cases, these sites can be detected because they are often overrepresent
of the overrepresented signals in sequences, or *motif-finding* has become a ce
There are two major computational frameworks for attacking the motif finding
representation of the signals. The most ...

Keywords: motif-finding, patterns, profiles, transcription factor binding sites

5 Corpus-based static branch prediction

Brad Calder, Dirk Grunwald, Donald Lindsay, James Martin, Michael Mozer, Benj

June 1995   ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 1995 confere
and implementation, Volume 30 Issue 6

Full text available: pdf(1.35 MB)   Additional Information: full citation, abstract, references, ci

Correctly predicting the direction that branches will take is increasingly impor
architectures. The name program-based branch prediction is given to static br
their prediction on a program's structure. In this paper, we investigate a new
prediction that uses a body of existing programs to predict the branch behavic
approach to program-based ...

6 Evidence-based static branch prediction using machine learning

Brad Calder, Dirk Grunwald, Michael Jones, Donald Lindsay, James Martin, Mich;
January 1997   ACM Transactions on Programming Languages and Systems (TOPL

Full text available: pdf(515.50 KB)   Additional Information: full citation, abstract, references, c

Correctly predicting the direction that branches will take is increasingly impor
architectures. The name program-based branch prediction is given to static br
their prediction on a program's structure. In this article, we investigate a new
prediction that uses a body of existing programs to predict the branch behavic
approach to program-ba ...

Keywords: branch prediction, decision trees, machine learning, neural worl
optimization

7 Array regrouping and structure splitting using whole-program reference affi

Yutao Zhong, Maksim Orlovich, Xipeng Shen, Chen Ding
June 2004 ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 2004 confere
and implementation, Volume 39 Issue 6

Full text available: pdf(202.16 KB)   Additional Information: full citation, abstract, referen

While the memory of most machines is organized as a hierarchy, program dat
space. This paper defines a model of *reference affinity*, which measures how c
together in a reference trace. It proves that the model gives a hierarchical pai
set of all data with the weakest affinity. At the bottom is each data element w
theoretical model, the paper p ...

Keywords: array regrouping, program locality, program transformation, refere
splitting, volume distance

8 Probabilistic discovery of overlapping cellular processes and their regulatio

Alexis Battle, Eran Segal, Daphne Koller
March 2004   Proceedings of the eighth annual international conference on Compu

Full text available: pdf(259.52 KB)   Additional Information: full citation, abstract, referenc

Many of the functions carried out by a living cell are regulated at the transcrip
expressed when they are needed. Thus, to understand biological processes, it
cell's transcriptional network. In this paper, we propose a novel probabilistic n
identifying overlapping biological processes and the regulatory mechanism coi
of our approach is that we a ...

Keywords: cellular processes, gene regulation, probabilistic relational models

9 Branch prediction for free
Thomas Ball, James R. Larus
June 1993 ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 1993 confere
and implementation, Volume 28 Issue 6
Full text available: pdf(1.49 MB)   Additional Information: full citation, abstract, references, ci

Many compilers rely on branch prediction to improve program performance by
and by aiding in scheduling instructions.Profile-based predictors require a time
compile-profile-compile cycle in order to make predictions. We present a prog
performs well for a large and diverse set of programs written in C and Fortran
analysis to pre ...

10 Using branch handling hardware to support profile-driven optimization
Thomas M. Conte, Burzin A. Patel, J. Stan Cox
November 1994   Proceedings of the 27th annual international symposium on M
Full text available: pdf(954.48 KB)   Additional Information: full citation, abstract, references,

Profile-based optimizations can be used for instruction scheduling, loop schedu
and instruction cache performance enhancement. However, these techniques
vendors because programs instrumented for profiling run 2–30 times s
compile-run-recompile sequence is required, and a test input suite must be cc
This paper proposes using existing bran ...

11 Technical papers: consistency management and quality assurance: Automa failure reports
Andy Podgurski, David Leon, Patrick Francis, Wes Masri, Melinda Minch, Jiayang
May 2003   Proceedings of the 25th International Conference on Software Engii
Full text available: pdf(1.06 MB) Publisher Site   Additional Information: full citation,

This paper proposes automated support for classifying reported software failur
and diagnosing their causes. A classification strategy is presented that involve
unsupervised pattern classification and multivariate visualization. These techr
executions in order to group together failures with the same or similar causes
to assess the frequency and s ...

12 Interfaces economics and computer science: Costly valuation computation
Kate Larson, Tuomas Sandholm
July 2001   Proceedings of the 8th conference on Theoretical aspects of rationalit
Full text available: pdf(862.73 KB)   Additional Information: full citation, abstract, re

We investigate deliberation and bidding strategies of agents wil
computation who are participating in auctions. The agents do n
valuations for the items begin auctioned. Instead they devote c
compute their valuations. We present a normative model of bou
deliberation actions of agents are incorporated into strategies a
standard auction protocols. We show that ...

13 Predicting conditional branch directions from previous runs of a program

Joseph A. Fisher, Stefan M. Freudenberger

September 1992 ACM SIGPLAN Notices , Proceedings of the fifth international conf(
programming languages and operating systems, Volume 27 Issu(

Full text available: pdf(1.13 MB)   Additional Information: full citation, references, citings

14 Improving semi-static branch prediction by code replication

Andreas Krall

June 1994 ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 1994 confere
and implementation, Volume 29 Issue 6

Full text available: pdf(752.92 KB)   Additional Information: full citation, abstract, references, citi

Speculative execution on superscalar processors demands substantially better
previously available. In this paper we present code replication techniques that
branch prediction to a level comparable to dynamic branch prediction scheme:
information about the correlation between different branches and about the c(
outcomes of a single branch. Using th ...

15 Active learning for automatic classification of software behavior

James F. Bowring, James M. Rehg, Mary Jean Harrold

July 2004 ACM SIGSOFT Software Engineering Notes , Proceedings of the 2004 A(
Software testing and analysis, Volume 29 Issue 4

Full text available: pdf(567.57 KB)   Additional Information: full citation, abstract, referen

A program's behavior is ultimately the collection of all its executions. This coll
generally unbounded. Thus it is especially suited to statistical analysis and m:
focus of this paper is on the automatic classification of program behavior usin(
classifiers for software engineering adopts a classical *batch-learning* approach
active-learning paradigm for ...

Keywords: Markov models, machine learning, software behavior, software tes!

16 Predicting data cache misses in non-numeric applications through correlati(

Todd C. Mowry, Chi-Keung Luk

December 1997   Proceedings of the 30th annual ACM/IEEE international symposi

Full text available: pdf(876.36 KB) Publisher Site   Additional Information: full citation, abstra:

To maximize the benefit and minimize the overhead of software-based latenc\
apply them precisely to the set of dynamic references that suffer cache misse:
provided by the state-of-the-art cache miss profiling technique (summary pro·
intermediate miss ratios - it results in either failing to hide latency, or else in:
overcome this problem, we propose and ev ...

Keywords: profiling, cache miss prediction, correlation, non-numeric applicati(

17 Software reliability and dependability: a roadmap
Bev Littlewood, Lorenzo Strigini
May 2000   Proceedings of the Conference on The Future of Software Engineerin
Full text available: pdf(1.57 MB)   Additional Information: full citation, references, citings, index t

Keywords: COTS reliability, dependability modelling and assessment, diversity

18 Better exploration of region-level value locality with integrated computation
Youfeng Wu, Dong-Yuan Chen, Jesse Fang
May 2001 ACM SIGARCH Computer Architecture News , Proceedings of the 28th a
Computer architecture, Volume 29 Issue 2
Full text available: pdf(940.95 KB)   Additional Information: full citation, abstract, references,

Computation-reuse and value-prediction are two recent techniq
microprocessor performance by exploiting value localities. They
dependence limit in traditional processors. In this paper, we prc
multithreading scheme in which the same hardware can be effic
reuse and value prediction. For the SpecInt95 benchmarks, our
integrated approach significantly out-performs either c ...

19 Research sessions: data mining applications: Cost-based labeling of group
Lei Chen, Zheng Huang, Raghu Ramakrishnan
June 2004   Proceedings of the 2004 ACM SIGMOD international conference on N
Full text available: pdf(351.21 KB)   Additional Information: full citation, abstract,

We make two main contributions in this paper. First, we motivate and introdu
that arise in labeling a group of mass spectra, specifically for analysis of atmo
applications to market-basket datasets. This builds upon other recent work in
labeling a single spectrum, and is motivated by the advent of a new generatio
Spectrometers, which are capable of generating ma ...

20 Discourse segmentation by human and automated means
Rebecca J. Passonneau, Diane J. Litman
March 1997   Computational Linguistics, Volume 23 Issue 1
Full text available: pdf(2.71 MB) Publisher Site   Additional Information: full citation, a

The need to model the relation between discourse structure and linguistic feat
acknowledged in the literature on discourse. However, there is only weak con:
structure are, or the criteria for recognizing and generating them. We present
using a corpus of spontaneous, narrative monologues. The first part of our pa
validating multitutterance units ...

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1 Automatic data layout for distributed-memory machines
Ken Kennedy, Ulrich Kremer
July 1998   ACM Transactions on Programming Languages and Systems (TOPLAS)
Full text available: 📄 pdf(633.20 KB)   Additional Information: full citation, abstract, references, citir

The goal of languages like Fortran D or High Performance Fortran (HPF) is to ɟ
machine-independent parallel programming model. After the algorithm selecti
intellectual challenge in writing an efficient program in such languages. The p
the target compilation system, the target machine, the problem size, and the
makes the choice of a good layout extremel ...

Keywords: high performance Fortran

2 Static correlated branch prediction
Cliff Young, Michael D. Smith
September 1999   ACM Transactions on Programming Languages and Systems (TC
Full text available: 📄 pdf(508.49 KB)   Additional Information: full citation, abstract, references,

Recent work in history-based branch prediction uses novel hardware structure
increase branch prediction accuracy. Branch correlation occurs when the outcc
accurately predicted by observing the outcomes of previously executed branch
this article, we show how to instrument a program so that it is practical to col
where branch correl ...

Keywords: branch correlation, branch prediction, path profiling, profile-driven

3 Target prediction for indirect jumps
Po-Yung Chang, Eric Hao, Yale N. Patt
May 1997 ACM SIGARCH Computer Architecture News , Proceedings of the 24th a
Computer architecture, Volume 25 Issue 2
Full text available: pdf(1.35 MB)   Additional Information: full citation, abstract, references, ci

As the issue rate and pipeline depth of high performance superscalar processo
work issued also increases. Because speculative work must be thrown away ir
wide-issue, deeply pipelined processors must employ accurate branch predicto
performance potential. Many existing branch prediction schemes are capable o
conditional branches. However, these schemes a ...

4 A Survey of Some Theoretical Aspects of Multiprocessing
J. L. Baer
January 1973 ACM Computing Surveys (CSUR), Volume 5 Issue 1
Full text available: pdf(4.05 MB) Additional Information: full citation, references, citings, index terms

5 Efficient and effective branch reordering using profile data
Minghui Yang, Gang-Ryung Uh, David B. Whalley
November 2002 ACM Transactions on Programming Languages and Systems (TO
Full text available: pdf(852.50 KB)   Additional Information: full citation, abstract, references,

The conditional branch has long been considered an expensive operation. The
increased as recently designed machines are now relying on deeper pipelines
number of conditional branches executed often results in a substantial perforr
code-improving transformation to reorder sequences of conditional branches t
constants. The goal is to obtain an orderi ...

Keywords: Conditional branches, branch reordering, profiling

6 Technical papers: testing I: Improving test suites via operational abstraction
Michael Harder, Jeff Mellen, Michael D. Ernst
May 2003 Proceedings of the 25th International Conference on Software Engii
Full text available: pdf(1.31 MB) Publisher Site   Additional Information: full citation,

This paper presents the operational difference technique for generating, augm
technique is analogous to structural code coverage techniques, but it operates
properties rather than the syntactic domain of program text.The operational d
test cases; it assumes only the existence of a source of test cases. The techni
abstractions (which describe obser ...

7 A two-layer library-based approach to synthesis of analog systems from VH

Alex Doboli, Nagu Dhanwada, Adrian Nunez-Aldana, Ranga Vemuri

April 2004   ACM Transactions on Design Automation of Electronic Systems (TODA

Full text available: pdf(658.00 KB)   Additional Information: full citation, abstract, referenc

This paper presents a synthesis methodology for analog systems described us
produces net-lists of analog components that are selected from a library, and
AC response, signal to noise ratio, dynamic range, area) are optimized. The g
implementations is bridged using a two-layered methodology. The first layer i
layer is component synthesis and constrain ...

Keywords: Analog synthesis, VHDL-AMS, branch-and-bound, genetic algorithm

8 Improving performance by branch reordering

Minghui Yang, Gang-Ryung Uh, David B. Whalley

May 1998 ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 1998 conferer
        and implementation, Volume 33 Issue 5

Full text available: pdf(1.51 MB)   Additional Information: full citation, abstract, references, ci

The conditional branch has long been considered an expensive operation. The
increased as recently designed machines are now relying on deeper pipelines
number of conditional branches executed can often result in a substantial perf
code-improving transformation to reorder sequences of conditional branches.
reordered are detected in the c ...

9 Compiler transformations for high-performance computing

David F. Bacon, Susan L. Graham, Oliver J. Sharp

December 1994   ACM Computing Surveys (CSUR), Volume 26 Issue 4

Full text available: pdf(6.32 MB)   Additional Information: full citation, abstract, references, citing

In the last three decades a large number of compiler transformations for optir
implemented. Most optimizations for uniprocessors reduce the number of insti
transformations based on the analysis of scalar quantities and data-flow techr
high-performance superscalar, vector, and parallel processors maximize parall
transformations that rely on tracking the properties o ...

Keywords: compilation, dependence analysis, locality, multiprocessors, optimi
processors, vectorization

10 Subrecursive Programming Languages, Part I: efficiency and program stru

Robert L. Constable, Allan B. Borodin

July 1972   Journal of the ACM (JACM), Volume 19 Issue 3

Full text available: pdf(1.89 MB)   Additional Information: full citation, references, citings, index terms

11 Predicting indirect branches via data compression

John Kalamatianos, David R. Kaeli

November 1998 Proceedings of the 31st annual ACM/IEEE international symposiun

Full text available: pdf(1.24 MB)   Additional Information: full citation, references, citings, index te

12 Technical papers: software understanding: Tools for understanding the beh

André Marburger, Bernhard Westfechtel

May 2003   Proceedings of the 25th International Conference on Software Engii

Full text available: pdf(2.23 MB) Publisher Site   Additional Information: full citat

Many methods and tools for the reengineering of software systems have been
domain-specific requirements of telecommunication systems have not been ac
designed in a process- rather than in a data-centered way. Furthermore, anal\
is a key to system understanding. In this paper, we report on tools for the ree
systems which we have developed in close cooperation wi ...

13 Selection conditions in main memory

Kenneth A. Ross

March 2004   ACM Transactions on Database Systems (TODS), Volume 29 Iss

Full text available: pdf(296.54 KB)   Additional Information: full citation, abstract, referen

We consider the fundamental operation of applying a compound filtering cond
memories available cheaply, systems may choose to keep the data entirely in
query and/or update performance.The design of a data-intensive algorithm in
account the architectural characteristics of modern processors, just as a disk-l
physical characteristics of disk devices. An importa ...

Keywords: Branch misprediction

14 Predicting conditional branch directions from previous runs of a program

Joseph A. Fisher, Stefan M. Freudenberger

September 1992 ACM SIGPLAN Notices , Proceedings of the fifth international confi
                programming languages and operating systems, Volume 27 Issu

Full text available: pdf(1.13 MB)   Additional Information: full citation, references, citings

15 Static program analysis: Using redundancies to find errors
Yichen Xie, Dawson Engler
November 2002   Proceedings of the 10th ACM SIGSOFT symposium on Foundatio

Full text available: pdf(265.85 KB)   Additional Information: full citation, abstract, referen

This paper explores the idea that redundant operations, like type errors, comr experimentally test this idea by writing and applying four redundancy checker many errors. We then use these errors to demonstrate that redundancies, eve with the presence of traditional hard errors (e.g., null pointer dereferences, ur how flagging redundant operations gives a ...

Keywords: error detection, extensible compilation

16 Parametric analysis for adaptive computation offloading
Cheng Wang, Zhiyuan Li
June 2004   ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 2004 confere
and implementation, Volume 39 Issue 6

Full text available: pdf(256.63 KB)   Additional Information: full citation, abstract, referen

Many programs can be invoked under different execution options, input param execution contexts may lead to strikingly different execution instances. The o| to the execution instances. In this paper, we show how to use parametric proc the optimization problem of computation offloading.Computation offloading ha improve performance and energy saving ...

Keywords: adaptive optimization, computation offloading, distributed system, program partitioning, program profiling, program transformation

17 Comparative efficiency of general and residual parsers
Frank G. Pagan
April 1990   ACM SIGPLAN Notices, Volume 25 Issue 4

Full text available: pdf(546.43 KB)   Additional Information: full citation, abstract,

Some fundamentals of the partial computation concept are concisely reviewed relationship between table-driven, general syntactic analyzers and source-lan(analyzers. A manual methodology for converting general parsers into generat(using an LL(1) parser as a detailed example. The results of several experimen space efficiencies of different general parsers wi ...

18 Compiling Esterel into sequential code
Stephen A. Edwards
June 2000   Proceedings of the 37th conference on Design automation
Full text available: pdf(152.63 KB)   Additional Information: full citation, abstract, references,

Embedded real-time software systems often need fine-grained parallelism and typical real-time operating systems do not provide. The Esterel language has slow code for large programs. This paper presents the first Esterel compiler at programs. It can produce code half the size and up to a hundred times faster Esterel's semantics allow th ...

19 Structured Programming with go to Statements
Donald E. Knuth
December 1974   ACM Computing Surveys (CSUR), Volume 6 Issue 4
Full text available: pdf(3.02 MB) Additional Information: full citation, references, citings, index terms

20 Attention and integration: Learning and reasoning about interruption
Eric Horvitz, Johnson Apacible
November 2003   Proceedings of the 5th international conference on Multimoda
Full text available: pdf(1.07 MB)   Additional Information: full citation, abstract, references,

We present methods for inferring the cost of interrupting users based on mult information generated by interactions with computing devices, visual and acou online calendars. Following a review of prior work on techniques for deliberatii associated with notifications, we introduce methods for learning models from expected cost of interruption for a user. We desc ...

Keywords: cognitive models, divided attention, interruption, notifications

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